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Vendor Input Sizing

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Office of the State Controller

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Summary Agenda

- Sizing Methodology and terms
- ERP 2005
  - Review sizing questionnaire / form
  - Review terminology definitions
  - Input values
  - Quicksizer results
- Portal 7.0
  - Scope & Architecture
  - Sizing Factors
  - SAP Quicksizer & Sizing Results
- BI 7.0
  - Factors Affecting Sizing
  - Scope
  - Sizing Parameters
  - HCM Baseline sizing
  - HCM Historical sizing
  - FI incremental sizing

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SAP Sizing approach

Two approaches are used to estimating the size of the SAP systems to guide configuring the appropriate hardware to support the SAP system. SAP provides a tool called Quick Sizer and this tool is used by all SAP projects to estimate capacity needed. The unit of measure from the Quick Sizer is called "SAPS", and all hardware partners are experienced in converting these into vendor-specific hardware configurations.

- **User-based sizing.** The user-based model asks the user to count the number of active (concurrent) users by module. SAP considers this model's ability to estimate the mySAP.com resource requirements to be limited because it does not consider important sizing factors such as user behavior, peak versus average workload, the amount of batch processing, reporting, interfaces, and user customization.
- **Quantity structure-based sizing.** The quantity structure-based sizing (previously the transaction-based sizing) model is more thorough than the user-based model because it considers actual or expected mySAP.com workload throughput. In addition to the number of mySAP.com users, this model gathers detailed information about the business processes and objects used, including the number of ERP dialogs, workload profiles, peak usage times, retention periods for business objects, and background and reporting processes. This detail information is unknown until the business blueprint design is completed for the implementation project.

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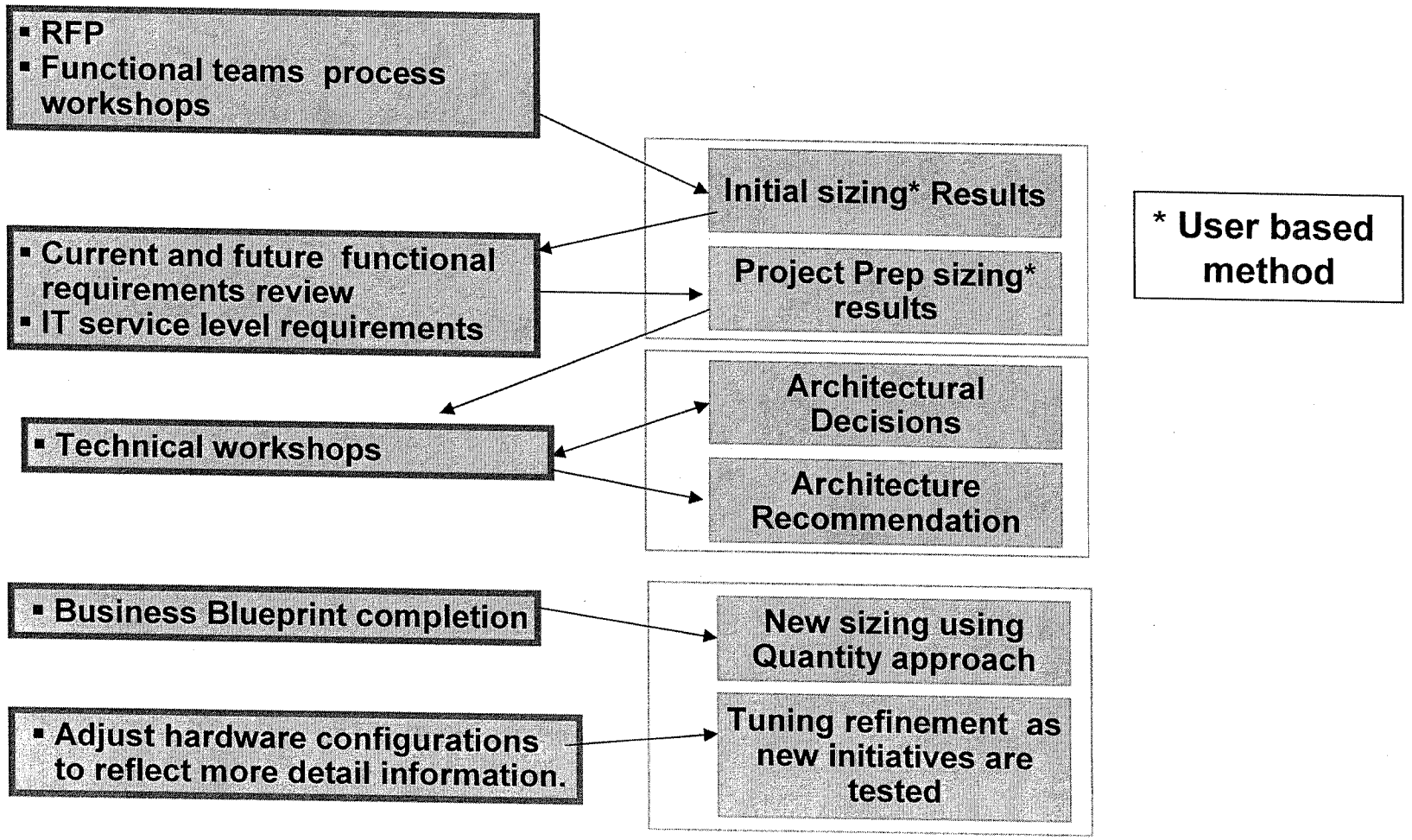
SAP system sizing process



* User based method

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Sizing: Methods and Goals

Sizing	Initial sizing	Advanced sizing
• Translate business requirements into hardware requirements • Configuration or landscaping is out of scope	• ≈ hardware budget for smaller companies • T-Shirt • Quick Sizer – users • Quick Sizer – some throughput • Offline questionnaire	• ≈ hardware budget for larger companies • Quick Sizer – throughput • Offline questionnaires • Formulas

Expert sizing	Re-sizing	Upgrade sizing
• for large/complex projects • Additional guidelines for Quick Sizer • Additional sizing guidelines • CCMS monitors • Sizing measurements • Custom sizing guidelines	• = delta sizing • CCMS monitors • When you extend an existing system • For example: 1000 users are live and you want to add 500 more	• SAP Notes • System analysis

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Sizing: Factors

Impacts on sizing

HW Platform	SAP software	System settings	Customizing
• Processor technology • Disk technology • Network technology • System infrastructure	• Release • OLTP or OLAP • Industry solutions	• Parametrization • Interfaces • Security settings • Unicode • A2A, B2B scenario	• Set up of business processes • Organizational structures • Business process design

Customer profile

Custom Coding	Data volume	Disk growth	User distribution
• Performance impact • Scalable • Business process design	• Time frame for high volume processing • Background processing Parallel jobs • Reporting • Data distribution	• Avoiding data • Archiving strategies • Information Lifecycle Mgmt.	• Concurrency • LAN/WAN • Internet/intranet

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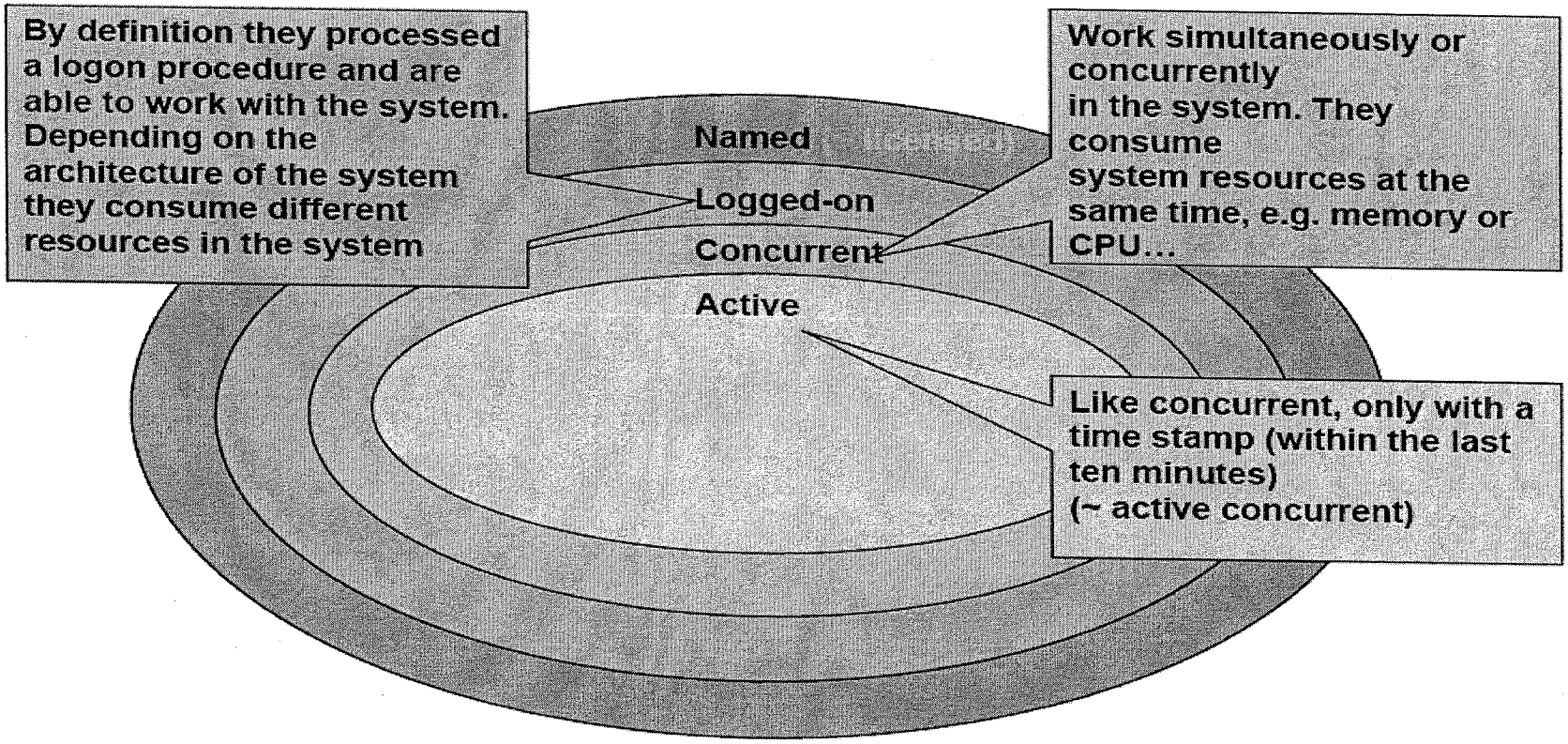
Sizing: User Definitions in SAP



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ERP 2005
Sizing Information

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ERP 2005: Quicksizer Questionnaire for HCM

		Start	End		Start	End	
Average work day		8:00 AM	5:00 PM	Peak Load	12:00	13:00	

Table 1: Active Users - Standard Sizing

	Element	*A/P*	*TI*	*Low*	*Medium*	*High*	*Short Text*
	PA-USER	A	S				
	PD-USER	A	S				

Table 2: Throughput - Standard Background Sizing without items - CPU

	Element	*A/P*	*TI*	*Objects*	*S.T*	*E.T*	*Short Text*
	HCM-PT	P	P		12	13	
	HCM-PY	P	P		12	13	

Column definitions follow →

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ERP 2005: Definition of Parameters

Parameter	Description
A/P	Average? / Peak?
TI	Time Interval (P-Peak, S-Snapshot, Y-Year, H-Hour)
Low	Processes on average ten dialog steps an hour
Medium	Processes on average 120 dialog steps an hour
High	Processes on average 360 dialog steps an hour
Concurrent users	Workers who works simultaneously in the system
PA-user	Personnel Admin, Benefits, Compensation Management, Recruitment, Personnel Time Management, Incentive Wages, Business Trip Management, Payroll Accounting
PD-user	Organizational Management, Personnel Development, Workforce Planning, Training and Event Management and Room Reservation Planning
PT	Evaluation program to calculate attendance and absence
PY	Number of employees and the number of retro calculations per payroll

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ERP 2005: Quicksizer Questionnaire for FI/CO

			Start	End		Start	End
Average work day			9:00 AM	6:00 PM	Peak Load	12:00	13:00

Table 1: Active Users - Standard Sizing

Element	*A/P*	*TI*	*Low Act.*	*Medium A*	*High Act.*	*Short Text*
FI-User	A	S				
CO-User	A	S				

Table 2: Throughput - Standard Sizing

Element	A/P	TI	Objects	Items	%change	%display	Months	Arch?	S.T	E.T	ID	Short Text
CO-PA-BIL	A	Y							9:00	18:00		
CO-PA-BIL	P	P							12:00	13:00		
CO-PA-FI	A	Y							9:00	18:00		
CO-PA-FI	P	P							12:00	13:00		
CO-PA-SLS	A	Y							9:00	18:00		
CO-PA-SLS	P	P							12:00	13:00		
CO	A	Y							9:00	18:00		
CO	P	P							12:00	13:00		
EC-PCA	A	Y							9:00	18:00		
EC-PCA	P	P							12:00	13:00		
FIN-BAC	A	Y							9:00	18:00		
FIN-BAC	P	P							12:00	13:00		

Table 3: Throughput - Standard Background Sizing Without Items - CPU

Element	A/P	TI	Objects	S.T	E.T	Short Text
CO-OM	P	P				
CO-OM-RATE	P	P				
CO-OM-SETT	P	P				

Column definitions follow →

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ERP 2005: FI-CO Sizing Parameter Definitions

Parameter	Description
FI-User	FI users (General Ledger, Accounts Receivable and Payable, Fixed Asset Accounting, and Financial Statements)
CO-User	Users in controlling
Objects	Sizing objects created per time unit (Year/Hour)
Items	Average number of line items per sizing objects
%Change	Number of changes to sizing objects in %
%Display	Number of displays to sizing objects in %
Months	Number of months the data remains in DB (Retention)
Arch?	Checks for existing archiving objects? [No sizing influence]
S.T	Start of processing time
E.T	End of processing time
ID	Way to represent multiple averages and peaks

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ERP 2005: mySAP Users Based on NC License Agreement

Area	Professional	Limited Professional	Employee
ERP 2005 Financials	6,739	1,884	0
ERP 2005 Human Resources	1,776	10,175	53,839
Total	8,515	12,059	53,839

Planning assumptions:

- 70/30% split for PA vs. PD
- 25% concurrent user vs. total users

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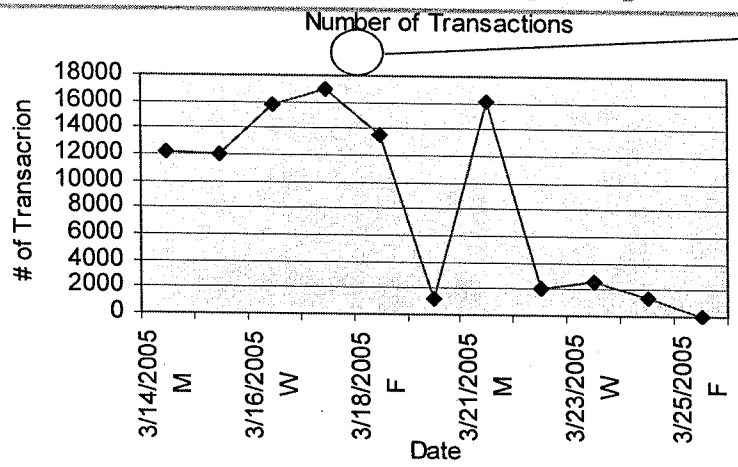
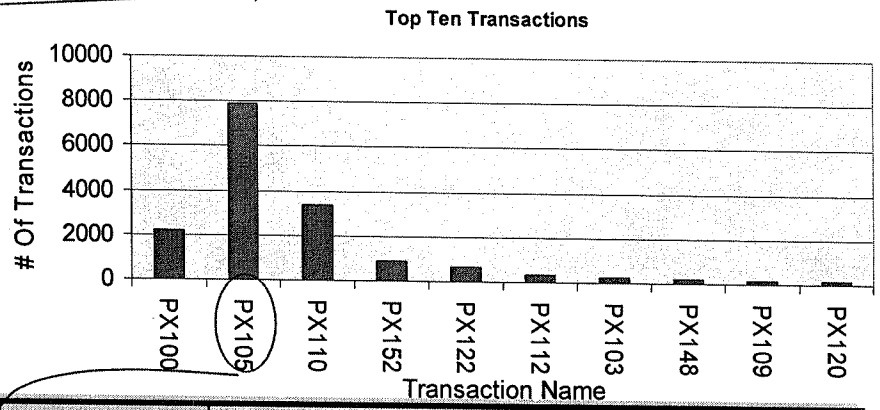
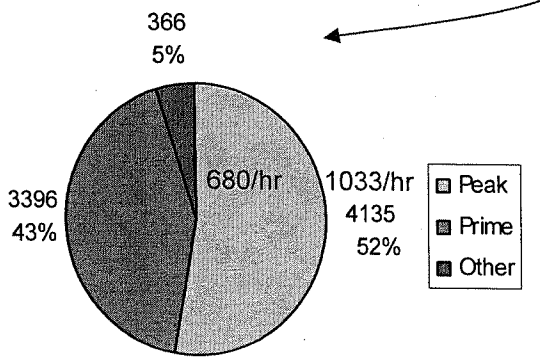
ERP 2005: Legacy System – Central Payroll Overview





PX105 Time Distribution



PX105 - Update Employee Database
Peak Time - Hours 9, 10, 14, 15 (4hrs)
Prime Time - Hours 8 – 16 (excluding Peak) (5hrs)
Other – Not prime or peak hours

File System	VSAM
Average PY Run	1.5 Hours
Peak Demands	Before cut off for each of the 5 payroll runs, after legislature increase, at year end before closing, slowest period is after monthly run
System Availability	Monday – Saturday 7:00am - 9:00pm Sunday 7:00am – 5:00pm
Backup / Retention	Nightly Backup for Disaster Recovery and all database update jobs
Planned Downtime	When 5 Payroll runs occur, any batch jobs during the day that uses the database , 9pm daily when IMS is brought down (7 backup, balancing an re-load jobs)

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ERP 2005: Legacy system - DOT Payroll Overview

File System	VSAM and DB 2 Databases
Database	**Payroll Master File (contains active and inactive)** 14,500 + records beginning of year 17,000 + records end of year **Report File (is used to print registers and checks)** 13,000 + records **Maintenance File (contains change cards for employee records)** 500 + records **Direct Deposit File** 10,000 + records (not all DOT employees use Direct Deposit. Some 3,000 receive checks
Peak Demands	Every other week when regular payroll runs, Month end payroll jobs, Supplemental payroll run, Non payroll monthly jobs, End of year, End of fiscal year.
System Availability	5 days a week between 7:00 and 5:00. The Payroll staff can request availability past 5:00. If they do, it can only be until 9:00. Batch processing is the constraint. Files are received from OSP and the DMV STARS system. System also send files to BSIP during batch processing.
Users	Primary users are the DOT Payroll staff (12 – 16), and an estimated 285 DOT field personnel. Peak time for DOT Payroll staff would be before any payroll runs. Peak time for DOT field personnel would be Fridays and Mondays prior to Regular Payroll running and Supplemental Payroll.
Backup / Retention	DBA 's (DOT IT) backup files every night. GDGs are created every time a payroll runs. This gives one year of data in case there is a need to rerun a Payroll. Using GDGs, other files are retained up to 6 months. At end of year, the Payroll Master file is backed up and then maintained for seven years. This file is used for W2 processing and any other end of year jobs.
Planned Downtime	Users cannot use on-line functions when certain Payrolls or steps within a Payroll are running. The only other downtime would be on Sundays when ITS is performing maintenance.

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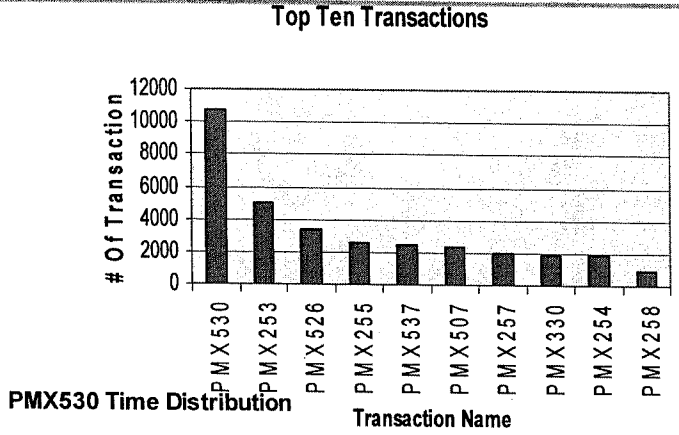
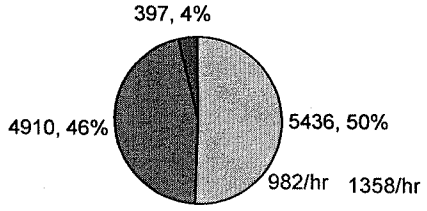
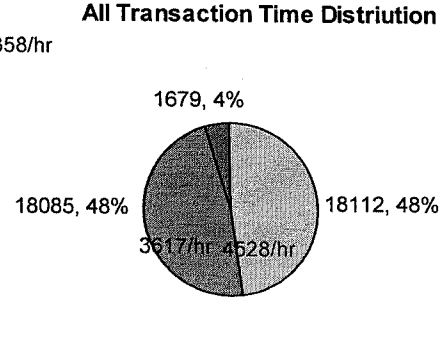
ERP 2005: Legacy System HR-PMIS Overview







File System	VSAM and DB 2 Databases
Database	- 9 Million Records over 27 years - Employee Database – 400,000 Records - Form History Database – 2,126,610 Records - Form History Events – 11,333,520
Performance Issues	Long-running batch message processing jobs during day time and turnover queries
Peak Demands	Before cut off for each of the 5 payroll runs, after legislature increase, at year end before closing, slowest period is after monthly run
Batch Processing	-Heaviest on the last working day of the month and following two days. Also on Friday and Wednesday Nights -Batch Jobs - 9:00pm – 7:00am
System Availability	Monday – Saturday 7:00am - 9:00pm Sunday 7:00am – 5:00pm
Users	2631 Active, 300-400 Concurrent, 3000 T&A
Backup / Retention	Nightly Backup for IMS, Twice per week for DB2
Planned Downtime	Nightly for batch processing

PMX530 – Position/Employee History Information
Peak Time - Hours 9, 10, 14, 15 (4hrs)
Prime Time - Hours 8 – 16 (excluding Peak) (5hrs)
Other – Not prime or peak hours

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ERP 2005: Quick Sizer Questionnaire for HCM – Filled In

		Start	End		Start	End	
Average work day		8:00 AM	5:00 PM	Peak Load	12:00	13:00	

Table 1: Active Users - Standard Sizing

	Element	*A/P*	*TI*	*Low*	*Medium*	*High*	*Short Text*
	PA-USER	A	S	1171	419	84	
	PD-USER	A	S	502	179	36	

Table 2: Throughput - Standard Background Sizing without items - CPU

	Element	*A/P*	*TI*	*Objects*	*S.T*	*E.T*	*Short Text*
	HCM-PT	P	P	811,670	21	24	Time pair run runs every two weeks
	HCM-PY	P	P	243,501	0	3	Two retro-calculations per period

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ERP 2005: Quick Sizer questionnaire for Financials – Filled In

	Start	End		Start	End
Average work day	8:00 AM	5:00 PM	Peak Load	12:00	13:00

Table 1: Active Users - Standard Sizing

Element	*A/P*	*TI*	*Low Act.*	*Medium A*	*High Act.*	*Short Text*
FI-User	A	S	826	414	138	80% of user
CO-User	A	S	209	103	34	20% of users

Table 2: Throughput - Standard Sizing

Element	A/P	TI	Objects	Items	%change	%display	Months	Arch?	S.T	E.T	ID	Short Text
CO-PA-BIL	A	Y							9:00	18:00		
CO-PA-BIL	P	P							12:00	13:00		
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EC-PCA	P	P							12:00	13:00		
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Element	A/P	TI	Objects	S.T	E.T	Short Text
CO-OM	P	P				
CO-OM-RATE	P	P				
CO-OM-SETT	P	P				

Only user based sizing considered

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ERP 2005: Additional Considerations

HCM Manual Sizing Scenarios for ERP incremental impact

SAP Quick Sizer does not offer parameter based automated sizing for the following HCM components:

- Employee Self Service (ESS) – ERP impact
- Manager Self Service (MSS) – ERP impact
- Learning Solution – future add on to ERP
- E-Recruiting – future add on to ERP

-> Sizing indicator [SAPS] needs to be calculated manually

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ERP 2005: ESS – ERP Impact

Employees can view, create and maintain data via their Web Browser

Sizing considers:

SAP R/3 system

- Primarily the HR solution

WebDynpro

- As Middleware

Enterprise Portal

SAP ESS consists of scenarios

- Office
- Time Management
- Business Trips
- Benefits
- Jobs
- Payment
- Training
- Qualifications
- Skills and appraisals
- Life and work events
- Personal information
- Purchasing

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ERP 2005: ESS Required Sizing Information

- Number of users that do ESS scenarios
- Number of users who perform the ESS scenarios within the considered time frame
  - For every scenario, the avg. Number of user interaction steps (that means communication to application) per business scenario
  - Usually between 5-15
- Peak load interval in hours

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ERP 2005: ESS Sizing

Total licensed ESS Users	**75,000**
Peak of ESS users in two-hour interval	**15,000**
Average number of ESS scenario steps	**4**
-> Total peak steps per hour	**60,000**

Additional SAPS calculation for ERP2005 for ESS scenarios:

1. WebDynpro ERP2005 [SAPS]

   ESS Total Steps per hour * 0.03 = 60,000 * 0.03 = **1800 SAPS**

2.A Backend ERP2005 [Medium PA users]

   ESS Total Steps per hour / 360 = 60,000 / 360 = 167 Medium PA users

2.B 167 medium PA users ~ **400 SAPS**

Total additional SAPS required = 1800 SAPS + 400 SAPS = 2200 SAPS

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ERP 2005: MSS – ERP Impact

Managers can view, create and maintain data via their Web Browser

Sizing considers:

SAP R/3 system

- HR
- Finance

WebDynpro

- As Middleware

Enterprise Portal

- As Front end

SAP ESS consists of scenarios

- Approvals
- Employee Information
- Working Time
- Competency Management
- Personnel Administration
- Recruiting
- Compensation Manager
- Headcount Planner
- Organizational Management
- Budget
- Project Management
- Planning
- Reports

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ERP 2005: MSS Sizing

Total licensed MSS Users	**11,000**
Peak of MSS users in two-hour interval	**2,750**
Average number of MSS scenario steps	**6**
-> Total peak steps per hour	**16,500**

Additional SAPS calculation for ERP2005 for MSS scenarios:

1. WebDynpro ERP2005 [SAPS]

   MSS Total Steps per hour * 0.03 = 16,500 * 0.03 = **495 SAPS**

2.A Backend ERP2005 [Medium PA users]

   MSS Total Steps per hour / 360 = 16,500 / 360 = 46 Medium PA users

2.B 46 medium PA users ~ **100 SAPS**

Total additional SAPS required = 495 SAPS + 100 SAPS = 595 SAPS

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ERP 2005: Learning Solution

Learning Portal

Access to the entire training program, which can consist of

- face-to-face classroom learning
- Virtual Classrooms
- Web-based or Computer-based training (CBT), and other contents.

Learners can register and receive an overview of their training history, learning progress, and appraisals, and can also enter their own appraisals.

Learning Management System

- To control the individual learning process by considering learners' are individual learning style and pace and in accordance with didactic strategies

Authoring Environment

- Various tools for authors and instructional designers to create learning contents and tests. External authoring tools can be seamlessly integrated

Content Management System

- To stores and manages learning content, contains special workflows to support authors in their work. It also incorporates interfaces to other content management systems.